Supplemental Digital Content 3: Risk of Bias Assessments

Supplemental Digital Content 3–1: Risk of bias assessment for randomized controlled trials (RCTs)

Research Questions	Study, Year, PMID	Random Sequence Generation	Allocation Concealment	Blinding of Participants	Blinding of Personnel/ Care Providers	Blinding of Outcome Assessors (Objective Outcomes)	Blinding of Outcome Assessors (Subjective Outcomes)	Incomplete Outcome Data	Selective Outcome Reporting	Other Bias	Eligibility Criteria Prespecified and Clearly Described	Intervention Clearly Described and Consistently Delivered	Outcomes Prespecified, Clearly Defined, Valid, Reliable, and Consistently Assessed	Overall RoB
Anatomic planes	Lee, 2021, 33691448	Unclear	Unclear	High	High	Unclear	N/A	Unclear	Unclear	Low	Yes	Yes	Yes	**Moderate**
ADM use	McCarthy, 2012, 23096987	Low	Low	High	High	Low	Low	Low	High	Low	Yes	Yes	Yes	**Moderate**
ADM use	Wendel, 2013, none	Unclear	Unclear	High	High	Low	N/A	High	High	Low	No	No	No	**High**

Abbreviations: PMID = PubMed identifier. Ratings are color coded for emphasis only. The colors do not impart unique information.

From the Cochrane Risk of Bias Tool (each item rated as Low, High, Unclear, or N/A [not applicable])

- Random sequence generation (selection bias): Selection bias (biased allocation to interventions) due to inadequate generation of a randomized sequence.
- Allocation concealment (selection bias): Selection bias (biased allocation to interventions) due to inadequate concealment of allocations prior to assignment.
- Blinding of participants (performance bias): Performance bias due to knowledge of the allocated interventions by participants during the study.
- Blinding of personnel/care providers (performance bias): Performance bias due to knowledge of the allocated interventions by personnel/care providers during the study.
- Blinding of outcome assessor (detection bias): Detection bias due to knowledge of the allocated interventions by outcome assessors during the study.
- Incomplete outcome data (attrition bias): Attrition bias due to amount, nature, or handling of incomplete outcome data.
- Selective outcome reporting (outcome reporting bias): Bias arising from outcomes being selectively reported based on the direction and/or strength of the results.
- Other Bias: Bias due to problems not covered elsewhere in the table.

From the National Heart, Lung, and Blood Institute (NHLBI) Quality Assessment Tool (each item rated as Yes, No, or Unclear)

- Eligibility criteria prespecified and clearly described: Potentially related to selection bias.
- Intervention clearly described and delivered consistently: Potentially related to performance bias.
- Outcomes prespecified, clearly defined, valid, reliable, and assessed consistently: Potentially related to detection bias.

Overall risk of bias assessed as **HIGH**, **MODERATE**, or **LOW**.

Research Questions	Study, Year, PMID	1.1 Potential for Any Confounding?	1.2 Potential for Time-Varying Confounding?	1.3 Intervention Switches Related to Prognostic Factors?	1.4 Appropriate Analysis Method for Confounding?	1.5 Appropriate Confounding Variables Used?	1.6 Inappropriate Control of Post-Intervention Variables?	Judgement – Risk of Bias Related to Confounding	2.1 Participant Selection Based on Post-Intervention Variables?	2.2 Post-Intervention Variables Associated with Intervention?	2.3 Post-Intervention Variables Associated with Outcome?	2.4 Start and Follow-Up (Duration) Coincide?	2.5 Appropriate Adjustment for Selection Bias	Judgement – Risk of Bias Related to Selection Bias
Timing	Eriksson, 2013, 24258257	Yes	No	N/A	Y	Y	N	Low	N	N/A	N/A	N	PY	Moderate
	Yoon, 2020, 32332528	Yes	No	N/A	Y	PY	N	Low	N	N/A	N/A	N	PY	Moderate
Timing, Materials	Cordeiro, 2015, 25742523	Yes	No	N/A	N	N/A	N	Serious	N	N/A	N/A	N	PY	Moderate
Timing, ADM use	Hirsch, 2014, 25347643	Yes	No	N/A	N	N/A	N	Serious	N	N/A	N/A	Y	N/A	Low
	Stein, 2020, 32561384	Yes	No	N/A	N	N/A	N	Serious	N	N/A	N/A	N	PY	Moderate
Materials	Antony, 2014, 24135689	Yes	No	N/A	PN	N/A	N	Serious	N	N/A	N/A	Y	N/A	Low
	Le, 2005, 15743498	Yes	No	N/A	N	N/A	N	Serious	N	N/A	N/A	Y	N/A	Low
	Macadam, 2010, 20009795	Yes	No	N/A	N	N/A	N	Serious	N	N/A	N/A	Y	N/A	Moderate
	McCarthy, 2010, 21136577	Yes	No	N/A	Y	PY	Y	Moderate	N	N/A	N/A	N	PY	Moderate
Anatomic planes	Avila, 2020, 33234947	Yes	No	N/A	N	N/A	N	Serious	N	N/A	N/A	Y	N/A	Low
	Gabriel, 2020, 32195862	Yes	No	N/A	N	N/A	N	Serious	N	N/A	N/A	Y	N/A	Low
	Kim, 2020, 33066236	Yes	No	N/A	Y	Y	Y	Moderate	N	N/A	N/A	Y	N/A	Low
	Kraenzlin, 2021, 32568752	Yes	No	N/A	N	N/A	N	Serious	N	N/A	N/A	Y	N/A	Low
	Nealon, 2020a, 32032345	Yes	No	N/A	PN	N/A	N	Serious	N	N/A	N/A	Y	N/A	Low
	Ozgur, 2020, 33223365	Yes	No	N/A	N	N/A	N	Serious	N	N/A	N/A	PY	N/A	Low
Anatomic planes, ADM use	Cattelani, 2018, 29275104	Yes	No	N/A	PN	N/A	N	Critical	N	N/A	N/A	Y	N/A	Low
ADM use	Brooke, 2012, 22868313	Yes	No	N/A	N	Y	N	Serious	N	N/A	N/A	PY	N/A	Low
	Chun, 2010, 20124828	Yes	No	N/A	N	N/A	N	Serious	N	N/A	N/A	Y	N/A	Low
	Craig, 2019, 29800083	Yes	No	N/A	Y	Y	N	Low	PY	Y	Y	N	N	Moderate
	Ibrahim, 2013, 24165587	Yes	No	N/A	Y	PY	PN	Low	PN	N/A	N/A	PY	N/A	Low
	Ganesh Kumar, 2021, 33172826	Yes	No	N/A	Y	Y	PN	Low	PN	N/A	N/A	PY	N/A	Low
	Lee, 2020, No PMID	Yes	No	N/A	N	N/A	N	Serious	N	N/A	N/A	Y	N/A	Low
	Liu, 2011, 21228744	Yes	No	N/A	N	N/A	N	Serious	N	N/A	N/A	PY	N/A	Low
	Nealon, 2020b, 31605310	Yes	No	N/A	N	N/A	N	Critical	N	N/A	N/A	Y	N/A	Low
	Pannucci, 2013, 23508050	Yes	No	N/A	Y	Y	N	Low	N	N/A	N/A	Y	N/A	Low
	Peled, 2012, 22634688	Yes	No	N/A	PN	N/A	N	Serious	N	N/A	N/A	Y	N/A	Low

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Research Questions	Study, Year, PMID	1.1 Potential for Any Confounding?	1.2 Potential for Time-Varying Confounding?	1.3 Intervention Switches Related to Prognostic Factors?	1.4 Appropriate Analysis Method for Confounding?	1.5 Appropriate Confounding Variables Used?	1.6 Inappropriate Control of Post-Intervention Variables?	Judgement – Risk of Bias Related to Confounding	2.1 Participant Selection Based on Post-Intervention Variables?	2.2 Post-Intervention Variables Associated with Intervention?	2.3 Post-Intervention Variables Associated with Outcome?	2.4 Start and Follow-Up (Duration) Coincide?	2.5 Appropriate Adjustment for Selection Bias	Judgement – Risk of Bias Related to Selection Bias
	Qureshi, 2016, 27465177	Yes	No	N/A	PN	N/A	N	Serious	N	N/A	N/A	Y	N/A	Low
	Safran, 2020, 32221195	Yes	No	N/A	PN	N/A	N	Serious	N	N/A	N/A	Y	N/A	Moderate
	Seth, 2012, 23018687	Yes	No	N/A	N	N/A	N	Serious	N	N/A	N/A	N	Y	Low
	Sobti, 2018, 29481386	Yes	No	N/A	N	N/A	Y	Serious	N	N/A	N/A	Y	N/A	Low
	Vardanian, 2011, 22030500	Yes	No	N/A	PN	N/A	N	Serious	Y	PN	N/A	Y	N/A	Low
	Weichman, 2012, 22544088	Yes	No	N/A	PY	PY	N	Low	N	N/A	N/A	Y	N/A	Low
	Woo, 2017, 28509694	Yes	No	N/A	PN	N/A	N	Serious	N	N/A	N/A	Y	N/A	Low

Abbreviations: N/A = Not applicable, NI = no information, NRCS = nonrandomized comparative study, PMID = PubMed identifier, PN = probably no, PY = probably yes.

Judgements are color coded for emphasis only. The colors do not impart unique information. Signaling questions are not color coded for simplicity and because they are only used to inform the judgements.

Responses to Risk of Bias in Nonrandomized Studies of Interventions (ROBINS-I) signaling questions 1.1 to 1.6 and 2.1 to 2.5 are in regular font. (each item rated as Yes, PY, NI, PN, No, or N/A)

Overall judgements about confounding and selection bias are in **bold font**. Each judgement is rated as **Low**, **Moderate**, **Serious**, **Critical**, or **NI**.

Supplemental Digital Content 3–3: Risk of bias assessment for nonrandomized comparative studies (NRCSs), Assessment of remaining biases and quality

Research Questions	Study, Year, PMID	Blinding of Participants	Blinding of Personnel/ Care Providers	Blinding of Outcome Assessors (Objective Outcomes)	Blinding of Outcome Assessors (Subjective Outcomes)	Incomplete Outcome Data	Selective Outcome Reporting	Other Bias	Eligibility Criteria Prespecified and Clearly Described	Intervention Clearly Described and Consistently Delivered	Outcomes Prespecified, Clearly Defined, Valid, Reliable, and Consistently Assessed	Overall RoB
Timing	Eriksson, 2013, 24258257	High	High	Low	Low	Low	Low	Low	Yes	No	Yes	High
	Yoon, 2020, 32332528	High	High	High	High	Low	Low	Low	Yes	Yes	Unclear	Moderate
Timing, Materials	Cordeiro, 2015, 25742523	High	High	High	N/A	Low	Low	Low	Yes	Yes	Yes	High
Timing, ADM use	Hirsch, 2014, 25347643	High	High	Low	N/A	Low	Low	Low	Yes	Yes	Yes	High
	Stein, 2020, 32561384	High	High	N/A	Low	Low	Low	Low	Yes	Yes	Yes	High
Materials	Antony, 2014, 24135689	High	High	Low	N/A	Low	Low	Low	Yes	Yes	Yes	High
	Le, 2005, 15743498	High	High	Low	N/A	Low	Low	Unclear	Yes	Yes	Yes	High
	Macadam, 2010, 20009795	High	High	N/A	Unclear	Low	Low	Low	Yes	Yes	Yes	High
	McCarthy, 2010, 21136577	High	High	N/A	High	Low	Low	Low	Unclear	Unclear	Yes	High
Anatomic planes	Avila, 2020, 33234947	High	High	Unclear	Low	Low	Low	Low	Yes	Yes	Yes	High
	Gabriel, 2020, 32195862	High	High	N/A	High	Low	Low	Low	Yes	Yes	Yes	High
	Kim, 2020, 33066236	High	High	High	N/A	Low	Low	Low	Yes	Yes	Yes	Moderate
	Kraenzlin, 2021, 32568752	High	High	High	High	Low	High	Low	Yes	Yes	Yes	High
	Nealon, 2020a, 32032345	High	High	Low	N/A	Low	Low	Low	Yes	Yes	Yes	High
	Ozgur, 2020, 33223365	High	High	N/A	Low	Low	Low	Low	Yes	Yes	Yes	High
Anatomic planes, ADM use	Cattelani, 2018, 29275104	High	High	Unclear	Unclear	Low	Low	Low	Yes	Yes	Yes	High

Research Questions	Study, Year, PMID	Blinding of Participants	Blinding of Personnel/ Care Providers	Blinding of Outcome Assessors (Objective Outcomes)	Blinding of Outcome Assessors (Subjective Outcomes)	Incomplete Outcome Data	Selective Outcome Reporting	Other Bias	Eligibility Criteria Prespecified and Clearly Described	Intervention Clearly Described and Consistently Delivered	Outcomes Prespecified, Clearly Defined, Valid, Reliable, and Consistently Assessed	Overall RoB
ADM use	Brooke, 2012, 22868313	High	High	High	N/A	High	Low	Low	Yes	Yes	Yes	High
	Chun, 2010, 20124828	High	High	Low	N/A	Low	Low	Low	Yes	Yes	Yes	High
	Craig, 2019, 29800083	Low	Low	Low	Low	Unclear	Low	Low	Yes	Unclear	Yes	Low
	Ibrahim, 2013, 24165587	High	High	High	High	Low	Low	Low	Yes	Unclear	Yes	Moderate
	Ganesh Kumar, 2021, 33172826	High	High	High	High	Low	Low	Low	Yes	Unclear	Yes	Moderate
	Lee, 2020, No PMID	High	High	N/A	Low	Low	Low	Low	Yes	Yes	Yes	High
	Liu, 2011, 21228744	High	High	Low	N/A	Low	Low	Low	Yes	Yes	Yes	High
	Nealon, 2020b, 31605310	High	High	Low	N/A	Low	Low	Low	Yes	Yes	Yes	High
	Pannucci, 2013, 23508050	High	High	Low	N/A	Low	Low	Unclear	Yes	Yes	Yes	Moderate
	Peled, 2012, 22634688	High	High	Low	N/A	Low	Low	Low	Yes	Yes	Yes	High
	Qureshi, 2016, 27465177	High	High	Unclear	N/A	Low	Low	Low	Yes	Yes	Yes	High
	Safran, 2020, 32221195	High	High	Low	N/A	Low	Low	Low	Yes	Yes	Yes	High
	Seth, 2012, 23018687	High	High	Unclear	N/A	Low	Low	Low	Yes	Yes	Yes	High
	Sobti, 2018, 29481386	Low	High	Unclear	N/A	Low	Low	Low	Yes	Yes	Yes	High
	Vardanian, 2011, 22030500	High	High	Low	N/A	Low	Low	Low	Yes	Yes	Yes	High
	Weichman, 2012, 22544088	High	High	Unclear	N/A	Low	Low	Low	Yes	Yes	Unclear	Moderate
	Woo, 2017, 28509694	High	High	Low	N/A	Low	Low	Low	Yes	Yes	Yes	High

Abbreviations: N/A = not applicable, NRCS = nonrandomized comparative study, PMID = PubMed identifier.
Ratings are color coded for emphasis only. The colors do not impart unique information.
From the Cochrane Risk of Bias Tool (each item rated as Low, High, Unclear, or N/A)

- Blinding of participants (performance bias): Performance bias due to knowledge of the allocated interventions by participants during the study.
- Blinding of personnel/care providers (performance bias): Performance bias due to knowledge of the allocated interventions by personnel/care providers during the study.
- Blinding of outcome assessor (detection bias): Detection bias due to knowledge of the allocated interventions by outcome assessors during the study.
- Incomplete outcome data (attrition bias): Attrition bias due to amount, nature, or handling of incomplete outcome data.
- Selective outcome reporting (outcome reporting bias): Bias arising from outcomes being selectively reported based on the direction and/or strength of the results.
- Other BiaStages: Bias due to problems not covered elsewhere in the table.

From the National Heart, Lung, and Blood Institute (NHLBI) Quality Assessment Tool (each item rated as Yes, No, Unclear, or No Data)

- Eligibility criteria prespecified and clearly described: potentially related to selection bias.
- Intervention clearly described and delivered consistently: potentially related to performance bias.
- Outcomes prespecified, clearly defined, valid, reliable, and assessed consistently: potentially related to detection bias.

Overall risk of bias assessed as **HIGH**, **MODERATE**, or **LOW**.